

## CLAIMS

What is claimed is:

1. A method for removing chemical pollutants comprising the steps of:
  - a. preparing a carbonaceous mixture of a graphite-containing feedstock;
  - b. placing the carbonaceous mixture in a contaminated medium containing chemical pollutants; and,
  - c. collecting the carbonaceous mixture saturated with chemical pollutants.
2. The method of claim 1, wherein the step of placing the carbonaceous mixture in the contaminated medium is carried out by dispersing the carbonaceous mixture onto a surface.
3. The method of claim 1, wherein the step of placing the carbonaceous mixture in the contaminated medium is carried out by dispersing the carbonaceous mixture into a liquid.
4. The method of claim 1, wherein the step of placing the carbonaceous mixture in the contaminated medium is carried out by passing a liquid or a gas through a filter.
5. The method of claim 4, wherein the filter comprises a mixture of expanded graphite and carbonaceous nanocrystals, wherein the content of the carbonaceous nanocrystals in the mixture is not less than 10%.
6. The method of claim 5, wherein the carbonaceous nanocrystals are nanotubes having a size of 1-10 nm, with added thereto free C, C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub> radicals.
7. The method of claim 6, wherein the radicals are in the form of one or several connected hexagonals.
8. The method of claim 7, wherein the radicals are in the form of one or several connected hexagonals with added thereto radicals of the type C, C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub>, and C<sub>5</sub>.
9. The method of claim 1, wherein preparing the carbonaceous mixture is carried out by chemical processing of the graphite-containing feedstock with at least one halogen-oxygen compound having the formula MXO<sub>n</sub>, wherein:
  - a. M is selected from the group of chemical substances consisting of H, NH<sub>4</sub>, Na and K;
  - b. X is selected from the group of chemical substances consisting of Cl, Br, and I; and,
  - c. n is 1,2,3, or 4.
10. The method of claim 9, further comprising a subsequent external action which results

in exothermal explosive-like decomposition of the processed graphite-containing stock with subsequent initiation of an autocatalytic breakdown process.

11. The method of claim 10, wherein the subsequent external action is carried out at normal pressure and room temperature.
12. The method of claim 10, wherein the subsequent external action is carried out by a process selected from the group consisting of photochemical, electrochemical, mechanical, thermochemical, sonochemical and direct chemical processes.
13. The method of claim 9, wherein the weight ratio of the graphite-containing feedstock to the halogen-oxygen compound is about 2:1.
14. The method of claim 1, wherein the graphite-containing feedstock is natural flaked graphite or graphite in the form of powder.
15. The method of claim 1, further comprising a step of removing chemical pollutants from the carbonaceous mixture saturated with chemical pollutants.
16. The method of claim 15, wherein the chemical pollutants are hydrocarbon pollutants.
17. The method of claim 15, wherein the step of removing chemical pollutants from the carbonaceous mixture is performed by a compression method.
18. The method of claim 17, wherein the compression method is accomplished by squeezing with a press.
19. The method of claim 15, further comprising reusing the carbonaceous mixture of expanded graphite and carbonaceous nanocrystals following removal of the chemical pollutants.
20. The method of claim 1, wherein removing the chemical pollutants is characterized by collecting oil and petroleum products from the surface of water.
21. The method of claim 20, wherein the placing of the carbonaceous mixture of expanded graphite and carbonaceous nanocrystals on the surface of water is carried out by dispersal into the body of the water.
22. The method of claim 21, further comprising placing a floating barrier on the surface of the water.
23. The method of claim 1, wherein the method is used for filtering drinking water comprising chemical pollutants using a filter made of a carbonaceous mixture of expanded graphite and carbonaceous nanocrystals.
24. The method of claim 23, wherein the chemical pollutants include hydrocarbon compounds.

25. The method of claim 1, wherein the method is used for removing chemical pollutants from industrial discharges.
26. The method of claim 1, wherein the method is used for purifying chemical pollutants from industrial discharges.
- 5 27. The method of claim 1, wherein the method is used for the removal of light fractions of petroleum products or gaseous condensate from free spaces of storage reservoirs.
28. The method of claim 1, wherein the method is used for neutralization of exhaust gases of internal combustion engines as the base of a matrix of a neutralizer of exhaust gases.
29. The method of claim 1, wherein the method is used as a filter for cigarettes for  
10 filtration of cigarette smoke.
30. The method of claim 1, wherein the method is used for purification of blood plasmas.
31. The method of claim 1, wherein the method is used as a sorbent for external application in cases of skin integument diseases which are characterized by discharge.
32. The method of claim 31, wherein placement on the skin integument is accomplished by  
15 the application of a bandage with a carbonaceous mixture.
33. The method of claim 31, wherein the method is used for treatment of burns and purulent wounds.